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August 12, 2010

Massachusetts Department of Energy Resources
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Subject: *Comments on Manomet Study on Forest Sustainability and Carbon Policy*

I am John Irving the plant manager of the McNeil Generating Station.

I have some additional comments I'd like to submit in addition to those submitted last month.

During the public meeting at the Massachusetts State House on July 27, 2010, a person commented publicly that McNeil Station in Burlington Vermont is burning whole trees. This person distributed pictures of what I understand to be a pile of logs at McNeil Station. I would like to offer some clarification on this issue for the record.

McNeil Station uses a wide variety of woody biomass for fuel including forest residues, mill residues, and clean wood waste. The plant also uses a small portion of roundwood (3.1% of total biomass consumption in 2009). The roundwood we use is low grade portions of trees minus tops.

We use this fuel for the following reasons:

- This fuel provides a backup wood supply which can be stored long-term for use during mud season. Chipped wood has a finite shelf life. In northern New England we experience what is called locally "mud season". In the late winter or early spring, warm days melt the upper levels of soil while the deeper soil is still frozen. Melted ice cannot drain as a result of this frozen ground resulting in widespread muddy conditions. It is often not possible to access the forest without causing significant disturbance or damage to the forest. In addition most of the secondary roads are closed to heavy weight vehicles to prevent road damage. It is difficult to predict when mud season will occur or how long it will last, but procuring wood during this period can be very limited. Chipped wood has a limited shelf life; roundwood can be stored indefinitely and allows the plant to operate through this period. It also allows wood suppliers to be productive during this period by bringing their chipping equipment to McNeil to chip the roundwood.
- Using roundwood allows the plant to diversify supply sources to draw from conventional (unmechanized) suppliers.
- Some landowners prefer to have the tops left on site.

The price McNeil Station pays for roundwood is less than the market price paid for firewood, pulpwood, and timber; we receive species not desired for those markets. Most of the roundwood received is pine and aspen that is not suitable for sawlogs.

One of the issues in the Manomet Study is the focus on efficiency. While it is obviously prudent to design and operate a facility as efficiently as possible, it is not appropriate to compare the efficiency of producing heat to that of producing electricity. To convert raw milk into bottled milk at the grocery store obviously takes less processing and energy than it does to make ice cream. This doesn't mean all raw milk should be made into bottled milk because it is "more efficient. There is a demand for both products.

It is relatively easy to produce heat with high efficiency. While using biomass for heat either in a home sized wood stove or a commercial sized unit to heat a school is about 70% efficient depending on the moisture content of the wood. A modern natural gas heater is typically over 90% efficient. This doesn't mean wood heat should be replaced with natural gas because it's more efficient. Using this logic homeowners would all use electric heat in their homes which is 100% efficient or even greater using heat pump technology. Obviously the inefficiencies of electric heat are in the plant producing the electricity.

The same is true of heating with pellets. The raw material for wood pellets is high moisture content wood that is dried at the point of pellet manufacture. This is where the major efficiency losses are incurred. The pellets are priced accordingly and the combustion of the pellets in the home is more efficient because of the drier fuel.

Producing combined heat and power (CHP) has the potential to provide both at very high efficiencies. Unfortunately there is a basic disconnect between biomass and heating customers that makes it very challenging to site a biomass CHP facility. Biomass is extremely volume intensive due to the low density of the fuel and relatively low calorific value. It takes 11 times as much volume of wood to provide the same energy with coal. This relates to many trucks, railcars, or barges to transport the fuel. At a plant like McNeil about 75% of the annual operating budget is fuel and about half of the fuel cost is transportation. From an economic and traffic perspective it makes more sense to locate the biomass plant near the fuel source than close to the electric customers. (Electrons are cheaper to transport than wood). If the biomass plants are near the forest there is little chance of a year round heat customer nearby. With most biomass sites in New England the only heat customer is for district space heating. This is much less desirable as the heating season is less than half the year and wood suppliers are typically not interested in developing a fuel supply infrastructure for a part time customer. High efficiency CHP is dependent on "heat leading" systems where no power is produced during periods of no heating load. McNeil Station was originally designed to provide CHP heat for use in district heating Burlington. We are now in our fourth attempt to make this actually happen, but the economics are very challenging. If it can't be done with an existing biomass plant located in the largest city in Vermont I'm sure most other areas will be difficult too.

In my opinion one of the most valid criteria in determining what biomass should be used for is by considering what fuel the biomass would displace. Is it a better choice to use biomass to displace relatively clean natural gas in a 90% efficient heating system or to displace coal in a 32% efficient power plant with the associated mining, health, air pollution, and ash issues not to mention the problems associated with typically transporting the fuel thousands of miles?

The biomass discussion in Massachusetts today is not so different from what occurred in Vermont 30 years ago when McNeil Station was proposed. At that time there were posters all over Burlington of a field of stumps with the caption "The Woodchip Plant Is Coming". We have a very thorough permitting process with plenty of public involvement. In order to build a power plant in Vermont the owner must receive a certificate of public good from the Vermont Public Service Board. This is an all encompassing permit that looks at air emissions, water emissions, aesthetics, archeological impacts, system stability, public health impacts, etc. and basically decide if the construction of the plant will result in an economic benefit to the state and its residents.

Some of the requirements of McNeil's Certificate of Public Good include:

- McNeil must employ foresters to ensure that wood is harvested sustainably and protect animal habitats and wetlands.
- Wood delivery trucks are limited in hours of delivery.
- Seventy five percent of McNeil's wood must be delivered by rail to mitigate traffic issues.
- Particulate emission limits that are still one of the lowest for solid fuel burning plants in the country.

As the manager of the largest and oldest biomass generator in New England I support biomass generation if it is designed, sited and operated well. Not all plants meet these criteria. Clearly over the years we have had issues at McNeil, particularly since as a municipal utility we are very open with our problems and as first of our kind we had a learning curve. I believe we have overcome these problems and hopefully others have benefitted from our experiences. It is difficult to quantify public acceptance of our plant, but for the past ten years we have enjoyed a high level of public support.

I base this on two things:

- In recent years complaints from neighbors have been basically non-existent.
- In 2008, McNeil voluntarily added a \$12 million system to reduce NOx emissions. For a purchase of this nature it is necessary to get a majority vote of the Burlington voters. It was made clear to residents that this improvement would make McNeil station run more and transport more wood and ash. In spite of this 93% of those voting voted in favor of this project.

The most publicized and troubling result of the Manomet Study was the press release stating that biomass carbon emissions are worse than coal. Last week a national biomass conference was held in Boston.

The introductory session was a panel discussion of Carbon Neutrality of Forest-Derived Biomass with panelists:

- Dave Tenny, President of the National Alliance of Forest Owners.
- Tom Walker, Team member of the Manomet Study largely responsible for the section on carbon neutrality.
- Bob Perschel, Northeast Region Forest Guild and Manomet Study Team member.
- Michael Goergen, CEO, Society of American Foresters.
- Dwayne Breger, Moderator and Director of Renewables, Massachusetts Department of Energy Resources.

After 1 hour and 45 minutes of intense discussion on this issue, Mr. Walker stated (and I paraphrase)

“We all agree that burning biomass is carbon neutral; we’re just debating the timeline!”

Respectfully submitted,

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